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New Syndrome?: MCA/MR Syndrome With Multiple Circumferential Skin Creases

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We describe a combination of multiple congenital anomalies, severe psychomotor retardation and symmetrical circumferential skin creases of arms and legs in a 4.5-year-old male. Craniofacial anomalies included: a high forehead, elongated face, bitemporal sparseness of hair, broad eyebrows, blepharophimosis, bilateral microphthalmia and microcornea, severe optic nerve hypoplasia, epicanthic folds, telecanthus, broad nasal bridge, puffy cheeks, microstomia, cleft palate, enamel hypoplasia, micrognathia, microtia with stenotic ear canals and posteriorly angulated ears. Head circumference was on the 10th centile and a CT scan showed dilated lateral ventricles. Intracranial pressure was not increased. Other abnormalities included: short stature, loose skin, hypotonia, pectus excavatum, inguinal and umbilical hernias, severe scoliosis, hypoplastic scrotum, long fingers and overlapping toes. Echocardiography showed tricuspid regurgitation. Chromosomes were apparently normal. Differentiation from "Michelin tire baby syndrome" and amniotic band sequence is discussed.

KEY WORDS: constriction rings, amniotic band sequence, Smith-Lemli-Opitz syndrome

INTRODUCTION

Congenital circumferential skin creases of the limbs are rare. They are seen as a part of the "Michelin tire baby syndrome" (MTB) [Kunze and Riehm, 1982; Niikawa et al., 1985; Bass et al., 1993], or as constriction rings in the amniotic band sequence [Gellis, 1977; Lubinsky et al., 1983; Lubinsky, 1983]. Patients with MTB syndrome generally do not have associated mental retardation or minor anomalies. The amniotic band sequence can result in amputation [Etches et al., 1982] and disruptions of facial structure (e.g., clefting) as seen in the ADAM (amniotic deformity, adhesions, mutilations) complex [Keller et al., 1978]; the pattern of anomalies in this condition is asymmetrical. However, mental retardation and minor facial anomalies are not features of this sequence. Here we present a patient with congenital symmetrical circumferential skin creases of arms and legs associated with a unique pattern of congenital anomalies and severe psychomotor retardation. This patient was briefly described by Cohen et al. [1993] in a review of circumferential skin folds.

CLINICAL REPORT

J.P. was the first child born (at 38 weeks of gestation) to a 27-year-old mother and 51-year-old father. During the first 7 months of pregnancy, weight gain was .5 kg and during the last 6 weeks, the mother gained 8 kg. She smoked 10–15 cigarettes per day throughout pregnancy. An ultrasound study in the ninth month documented intrauterine growth retardation with no major cardiac or respiratory problems. There was no mention of associated polyhydramnios. The family history was unremarkable. A sister of the mother died at age 2 hours apparently due to respiratory problems. Birth length was 45.2 cm (3rd centile) and birth weight was 3 kg (25th centile). Our patient had a right inguinal hernia repair at age 1 month, bilateral epicanthus repair at age 2 years and repair of a cleft palate at age 3 years. At 4.5 years, he was able to sit unaided (momentarily) and was also able to smile and laugh. He first rolled over at age 2 years. His parents reported that he imitates some sounds and is responsive to certain questions.

The physical examination at 4.5 years of age revealed a severely retarded boy who was unable to walk or speak. His head circumference was 49 cm (10th centile) and length was 91 cm (<5th centile). He had frontal bossing, high forehead, elongated face, bitemporal sparseness of hair, broad eyebrows, bilateral epicanthic folds, short palpebral fissures, microphthalmia, telecanthus, broad nasal bridge, repaired cleft palate, microstomia, micrognathia, small, posteriorly angulated and apparently low-set ears, puffy cheeks, hypoplastic zygomatic arch, aberrant teeth and enamel hypoplasia (Fig. 1a,b). He also had pectus excavatum, thoracolum-

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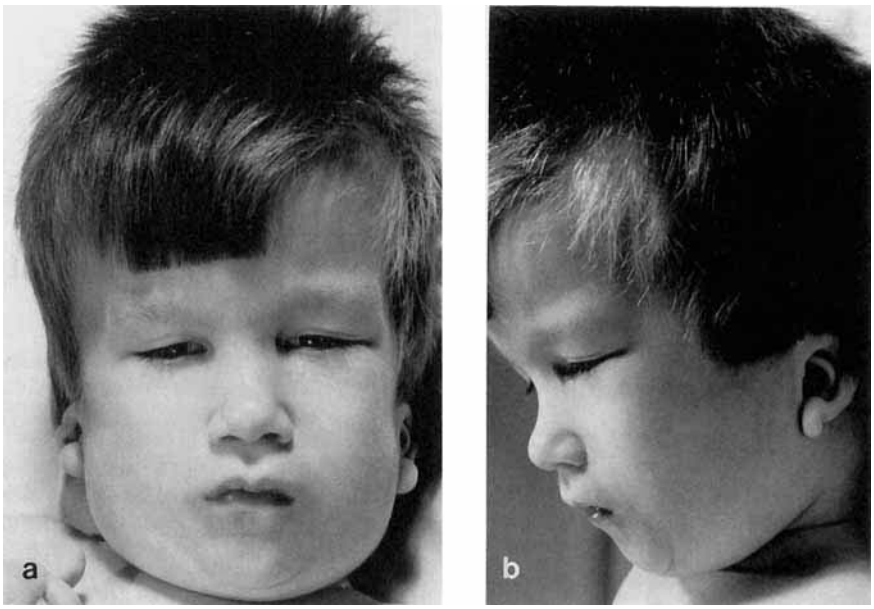

Fig. 1. **a:** Face, frontal view. **b:** Face, lateral view.

bar scoliosis, hypoplastic scrotum and retractile testes (Fig. 2). The feet were narrow with overriding toes. The skin showed symmetrical transverse annular creases on upper and lower limbs (Fig. 3a–c). Dermatoglyphics of the left hand demonstrated a single transverse palmar crease, a radial loop on the 1st finger and ulnar loops on the 2nd, 3rd, 4th and 5th fingers. On the right hand, the 1st finger showed a radial loop. The 2nd, 4th, and 5th fingers demonstrated ulnar loops and there was an arch on the 3rd finger.

Investigations included: normal chromosomes—46,XY (peripheral blood and fibroblast cultures). CT scan of head documented moderately dilated ventricles with rather selective dilatation of the frontal horns without increase in intracranial pressure. The ventricular changes were thought to be ex vacuo rather than secondary to CSF obstruction. The skeletal survey demonstrated D-convex dorsal scoliosis, evidence of anterior scalloping of the lumbar vertebral bodies, bilateral coxa valga and diffuse osteopenia in the limbs. Transverse metaphyseal dense lines or postgrowth arrest lines were also noted. Auditory brainstem-evoked response showed mild–moderate mixed hearing loss on the right and moderate–severe hearing loss on the left. On echocardiography he was found to have tricuspid regurgitation.

DISCUSSION

The circumferential constriction skin rings found in our patient are reminiscent of "Michelin tire baby syndrome." This syndrome is characterized by ring-shaped skin creases involving primarily the limbs and neck and was first described in a female patient who was also found to have left hemihypertrophy [Ross, 1969]. This author alluded to the similarities with the French tire manufacturer mascot, Michelin, in naming the syndrome. The pattern of skin creases tends to be symmetrical, temporary and does not adversely affect the patient's health. Family history suggests autosomal dominant inheritance [Kunze and Riehm, 1982; Niikawa et al., 1985; Bass et al., 1993]. The latter author discussed MTB syndrome as familial "constriction rings" in four generations including male to male transmission.

Although skin creases are the predominant sign, other anomalies have also been reported. One family reported by Kunze and Riehm [1982] included a father and son, with the father having few circular alterations, and the son having, in addition, a median cleft palate and neuroblastoma. Another case reported in this paper shared additional characteristics with our patient, namely: micrognathia, malformed ears, and median cleft palate. The chromosomes of this patient were apparently normal [46,XX].

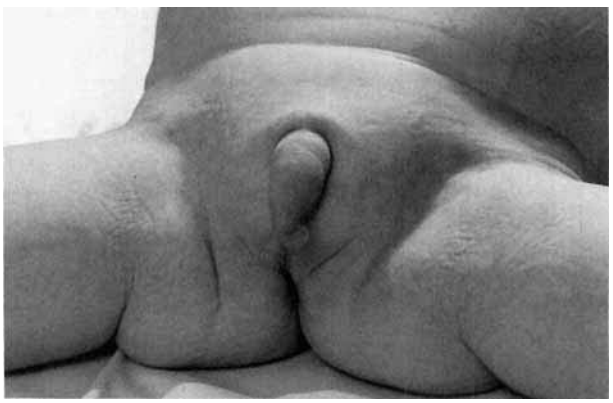

Fig. 2. External genitalia demonstrating severely hypoplastic scrotum.

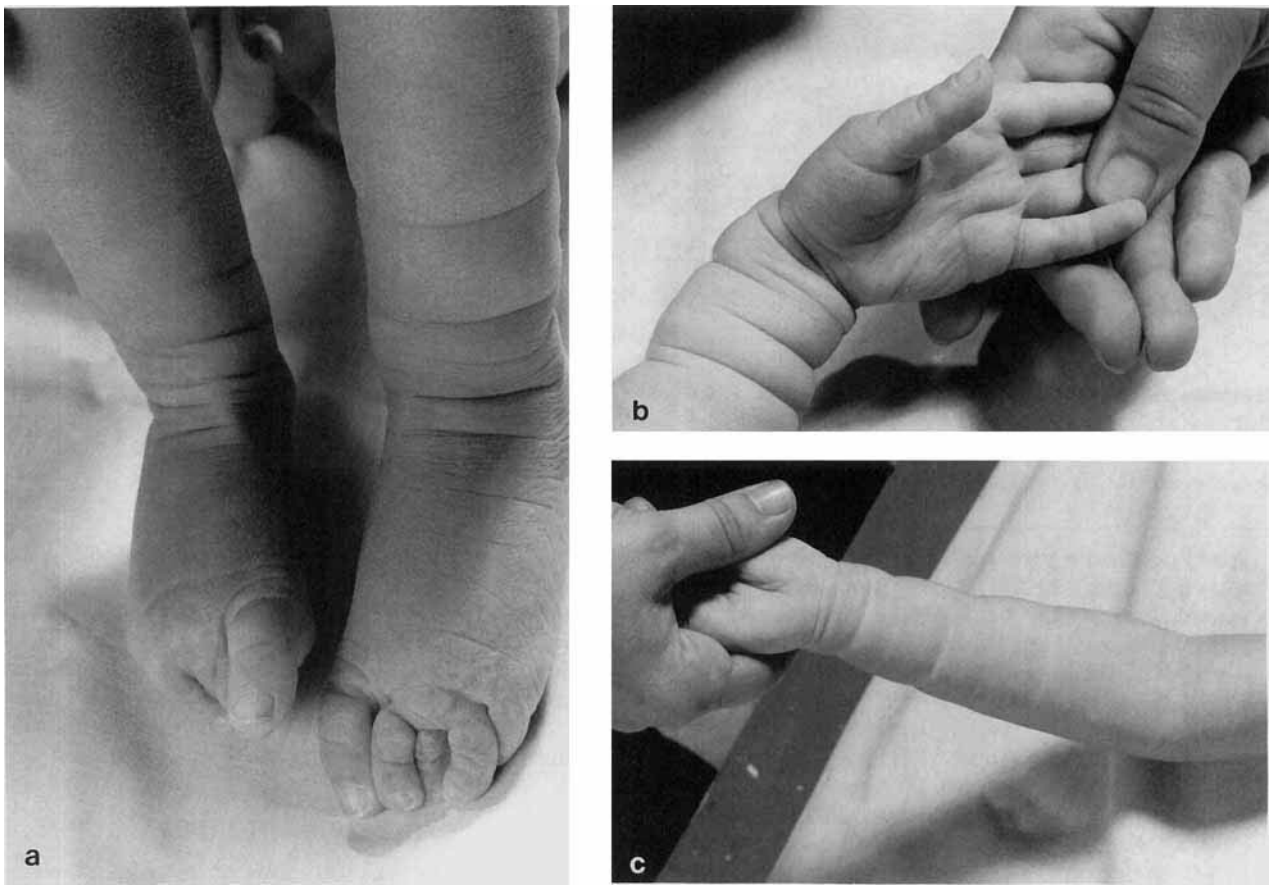

Fig. 3. **a:** Legs and feet demonstrating circumferential symmetrical rings, narrow feet with overriding toes. **b:** Left forearm and hand revealing the circumferential rings and single palmar crease. **c:** Right arm showing symmetrical circumferential rings.

The third case reported by the same authors had slight mental retardation. Severe mental retardation in association with skin rings was described in a patient by Gardner et al. [1979]. This patient was also found to have a deletion of 11p. The patients of Ross [1969] and Gardner et al. [1979] were found to have underlying lipomatosus nevus, a manifestation which has not been described in other published cases.

Despite the fact that our patient has skin creases as seen in "Michelin tire baby syndrome," no single syndrome can explain his constellation of anomalies. We therefore believe that our patient represents a syndrome which has not been previously described.

REFERENCES

Bass HN, Caldwell S, Brooks BS (1993): Michelin tire baby syndrome: familial constriction bands during infancy and early childhood in four generations. Am J Med Genet 45:370–372.

Cohen MM, Jr, Gorlin RJ, Clark R, Ewing SG, Camfield PR (1993): Multiple circumferential skin folds and other anomalies: A problem in syndrome delineation. Clin Dys 2:39–46.

Etches PC, Stewart AR, Ives EJ (1982): Familial congenital amputations. J Pediatr 101:448–449.

Gardner EW, Miller HM, Lowney ED (1979): Folded skin associated with underlying nevus lipomatosus. Arch Dermatol 115:978–979.

Gellis SS (1977): Constrictive bands in the human. Birth Defects Orig Art Ser XIII(1):259–268.

Keller H, Neuhauser G, Durkin-Stamm MV, Kaveggia EG, Schaff A, Sitzmann F (1978): "ADAM complex" (amniotic deformity, adhesions, mutilations)—a pattern of craniofacial and limb defects. Am J Med Genet 2:81–98.

Kunze J, Riehm H (1982): A new genetic disorder: Autosomal-dominant multiple benign ring-shaped skin creases. Eur J Pediatr 138:301–303.

Lubinsky M (1983): Familial amniotic bands (Letter). J Pediatr 102:323.

Lubinsky M, Sujansky E, Sanger WM, Salyards P, Severn C (1983): Familial amniotic bands. Am J Med Genet 14:81–87.

Niikawa N, Ishikiriyzma S, Shikimani T (1985): The Michelin tire baby syndrome—an autosomal dominant trait (Letter). Am J Med Genet 22:637–638.

Ross CM (1969): Generalized folded skin with an underlying lipomatous nevus: The Michelin tire baby. Arch Dermatol 100:320–323.